NOTICE

All drawings located at the end of the document.

ER/WM&I DDT

RFCA Milestone

Source/Driver: (Name & Number from ISP, IAG milestone, Mgmt. Action, Corres. Control, etc.)

Closure #: (Outgoing Correspondence Control #, if applicable)

Due Date

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Document Subject: 5/23/97

TRANSMITTAL FOR THE DRAFT DECISION DOCUMENT FOR THE MOUND SITE PLUME - AMT-059-97

Discussion/Issues:

The Draft Decision Document for the Mound Site Plume is enclosed for your review and submittal to the Department of Energy (DOE) for concurrent review. Comments on the Decision Document are requested by June 2, 1997. Also enclosed are five copies for Kaiser Hill and five copies for the DOE.

If you have any questions regarding this document, please contact John Hopkins at extension 4974, or Annette Primrose at extension 4385.

JKH:cb

Attachments:
As Stated

cc:
M. C. Broussard
J. K. Hopkins
A. L. Primrose
A. M. Tyson
Correspondence Control

ADMIN RECORD

I113-B-00001

RF/RMRS-97-024

DRAFT MOUND SITE PLUME DECISION DOCUMENT

Major Modification to the
Final Surface Water Interim Measures/Interim Remedial
Action Plan/Environmental Assessment and
Decision Document for South Walnut Creek
March 1991, Revised October 1994

May 27, 1997

Revision: Draft

Draft

MOUND SITE PLUME DECISION DOCUMENT

May 1997

Major Modification to the Final Surface Water Interim Measures/Interim Remedial Action Plan/Environmental Assessment and Decision Document for South Walnut Creek

March 1991, Revised October 1994

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1.0 INTRODUCTION

This document represents a major modification to the Final Surface Water Interim Measures/ Interim Remedial Action Plan/Environmental Assessment and Decision Document for South Walnut Creek (IM/IRA) (DOE 1991). The original IM/IRA was written as a result of an agreement between Department of Energy Rocky Flats Field Office (DOE RFFO), Colorado Department of Public Health and Environment (CDPHE), and the Environmental Protection Agency (EPA) to address the issue of contaminated surface water in a portion of the South Walnut Creek Drainage at the Rocky Flats Environmental Technology Site (RFETS). This action originally consisted of collection and treatment of three surface water sources: surface water seep SW059, South Walnut Creek, and the outfall from a culvert at surface water seep SW061. Water from these sources was collected and piped to the Operable Unit 2 (OU 2) Field Treatability Unit for treatment, then discharged to South Walnut Creek.

There have been many changes to this IM/IRA since it was implemented. Sampling data from several years proved that there is no unacceptable risk from two of the three sources. As a result, waters from those two sources are no longer collected. In addition, use of the OU 2 Field Treatability Unit has been discontinued. The water from SW059 is collected, pumped to a tank near the seep, then trucked to the Consolidated Water Treatment Facility for treatment, and discharged after treatment to the South Interceptor Ditch in the Woman Creek Drainage.

The proposed action will consist of constructing a subsurface groundwater collection system coupled with a passive reactive metals treatment system to treat contaminated groundwater from the Mound Site plume to the Segment 5 action levels specified in the Rocky Flats Cleanup Agreement (RFCA) (DOE 1996). The project will be conducted in accordance with RFCA, DOE Orders and RFETS policies and procedures. The project will also utilize lessons learned from previous accelerated actions and will remediate one of the top ten IHSS sites at RFETS.

2.0 PURPOSE

This document addresses the surface water from SW059 that continues to be managed pursuant to the original IM/IRA. This modification proposes a new method to intercept and treat contaminated groundwater from the Mound Site Plume, including SW059, prior to discharge to South Walnut Creek. Collection and treatment of the hazardous substances in the Mound Site plume will mitigate a source of surface water contamination. This action proposes using an innovative technology that permanently treats the hazardous constituents in a manner which is protective of site workers, the public, and the environment.

This Decision Document outlines the selected strategy, applicable requirements, and implementation schedule to accomplish the Mound Site Plume groundwater interception and treatment project. The Mound Site Plume is ranked seventh on the current ER Ranking (DOE 1996). Implementation of the project is being conducted in accordance with RFCA (DOE 1996), and Federal, State, and local laws, as well as DOE Orders and RFETS policies and procedures.

3.0 PROJECT DESCRIPTION AND OBJECTIVES

The Mound Site Groundwater Plume is located north of Central Avenue, and east of the protected area fence (Figure 1). This plume of primarily volatile organic compound (VOC) contaminated groundwater is believed to originate from the Mound Site, and extend northward to where the plume discharges as seeps (including SW059) and subsurface flow into the South Walnut Creek Drainage. VOC contaminated groundwater found in monitoring wells between the Mound Site and South Walnut Creek, indicates that the Mound Site was the primary source area for the plume.

A downgradient capture system will be installed near South Walnut Creek to capture the contaminated groundwater to the extent practicable, and to minimize contaminant impacts to surface water. The groundwater will be collected and treated at a centralized treatment cell to meet RFCA requirements (Segment 5 stream standards), then discharged into surface water downgradient of the capture system. The downgradient capture system was chosen based on evaluation of other more traditional options in the Groundwater Conceptual Plan (RMRS 1996a).

The project has the following objectives:

- Intercept and treat contaminated groundwater including SW059 in the distal end of the Mound Site Plume.
- Design and install a passive groundwater treatment system that, to the extent practicable, protects surface water and reduces the contaminant mass loading in surface water consistent with the RFCA Action Levels and Standards Framework.
- Design the reactive metals treatment system and the barrier wall construction method to minimize the generation of low level mixed waste and/or low level waste.
- Design the reactive metals treatment system for easy access for operation and maintenance and for ease in media replacement or final removal.
- Develop cost and performance data for design of low cost and effective treatment systems for other Site plumes and plumes in the DOE complex.
- Minimize the impacts to the Prebles Meadow Jumping Mouse during construction by installing silt fences between the construction area and the creek to prevent downstream sedimentation of habitat.
- Design the system so that treated groundwater will not visually impact Walnut Creek.
- Provide an opportunity for stakeholder review and observation of the technology.

3.1 Background

Approximately 1,405 intact drums were stored on the ground and covered with soil at the Mound Site between April 1954 and September 1958. The drums contained uranium and beryllium-contaminated lathe coolant (a mixture of approximately 70 percent hydraulic oil and 30 percent carbon tetrachloride). Historical information also indicates that some of the coolant contained low levels of plutonium. In 1970, all drums along with some radiologically contaminated soil were removed from the Mound Site. Approximately 10 percent of the drums were thought to be leaking at the time of removal. However, there are no records of the volume of contaminants released to the soils at the Mound Site (DOE 1992).

An accelerated removal action was completed in the spring of 1997 to excavate the soil contaminated with VOCs above Tier I action levels from the Mound Site (DOE 1997). Low temperature thermal desorption technology will be used in the summer of 1997 to remove the VOC contaminants of concern from the excavated soils. The treated soil below action levels will

be returned to the Mound Site excavation and the area will be revegetated. As part of this action, during March 1997, a permanent culvert was installed in the previously unlined Central Avenue Ditch in the vicinity of the Mound Site. This Ditch is immediately upgradient of the Mound Site source area, and probably contributed water to the Mound Site Plume. The culvert is expected to decrease the recharge of water to the Mound Site Plume (DOE 1997).

Another potential source of contamination contributing to the Mound Plume may be the fill material placed during construction of the protected area fence and the eastern road. This fill material may include the soil from IHSS 153 - Oil Burn Pit, which was excavated during construction of south east corner of the protected area fence (Figure 1). The present ground level elevation at the former IHSS 153 site is 11 feet below original grade.

3.2 Previous Investigations

The Mound Site area was extensively investigated as part of the OU 2 Phase II RFI/RI investigation. VOCs were identified in both subsurface soil, and in the groundwater contaminant plume north of the Mound Site which extends towards South Walnut Creek (DOE 1995). Additional investigations in 1994, 1995 and 1996 confirmed and delineated the Mound Site source area (EG&G 1994, RMRS 1996b, RMRS 1996c).

A geoprobe investigation to refine the known extent of the distal edge of the plume was conducted in late 1996 by EPA (EPA 1996). The location of these geoprobe holes is shown on Figure 1. Groundwater was collected and analyzed where possible. Many of the geoprobe holes on the eastern side of the area were dry. VOC contaminated groundwater was found in several geoprobe holes, especially in the central portion of the area. The highest VOC concentrations were found near the center of the distal end of the plume, at location 12 where 4,200 ug/l of tetrachloroethene and 3,800 ug/l of trichloroethene was detected. Groundwater containing low levels of VOCs (19 ug/l of tetrachloroethene and 14 ug/l of trichloroethene) was also found at location 17 on the west side of the eastern road around the protected area. This may indicate the presence of a separate source area west of seep SW059, or may indicate recharge from fill in this area which may contain VOC contamination at low levels.

A pre-remedial investigation was conducted in March and April 1997 to determine the extent and configuration of the Mound Site Plume near South Walnut Creek. Eighteen geoprobe holes were pushed, and temporary wells were installed in these holes. The results of this investigation are discussed in the following sections. Since the investigation was conducted during a period of rain, snow fall and snow melt, water table elevations were probably close to their maximum levels.

3.3 Hydrogeologic Setting

At the source area for the Mound Site Plume, bedrock unconformably underlies approximately 12 feet of surficial deposits and consists of weathered claystone and minor sandstones of the Cretaceous Arapahoe and Laramie Formations (DOE 1995, DOE 1997). The Arapahoe No. 1 Sandstone subcrops under the northwest corner of the Mound Site, and is truncated to the north by the South Walnut Creek drainage in an area of intermittent seeps (DOE 1995, RMRS 1996a).

Near the distal end of the plume, clay-rich colluvium partially derived from the Rocky Flats Alluvium unconformably overlies Laramie Formation claystone (DOE 1995, EG&G 1995a, EG&G 1995b, RMRS 1996c, and RMRS 1996a). The elevation to bedrock is variable as this area has been extensively disturbed by landslides and/or slumps. Aerial photographs showed that the area was extensively regraded in 1962, probably as part of the installation of the protected area fence immediately to the west. Therefore, the bedrock surface does not closely mimic the topography. The bedrock surface forms a shallow trough plunging to the north, which probably directs groundwater flow. Depth to the bedrock surface varies from 5 to 15 feet over much of the area. At the eastern extent, bedrock is 25 feet below ground surface due to fill material brought in for the eastern perimeter road.

The bedrock/colluvial contact was difficult to determine at several locations as both the colluvium and bedrock consist of fractured, weathered claystone. At location 10397, flowing sands prevented the Geoprobe from reaching the depth of the bedrock contact. In addition, there are landslide or slump features at locations 10597, 11097, and 11197.

The groundwater occurs in the alluvium, colluvium, and the underlying Number One Sandstone. Groundwater flow in the alluvium and colluvium is primarily to the north along the bedrock

surface. Recharge occurs primarily through local infiltration of precipitation or local runoff. Geometric mean hydraulic conductivities are 6 x 10^{-04} cm/sec for the Rocky Flats Alluvium and 8 x 10^{-08} cm/sec for the weathered claystone (DOE 1995). Geometric mean hydraulic conductivity for the colluvium is 9 x 10^{-05} cm/sec (EG&G 1995b).

The groundwater discharges through surface and subsurface seeps along the hillside, seeps on the south bank of South Walnut Creek including SW059, and through evapotranspiration. Infiltration into the underlying unweathered claystone is limited (DOE 1995, EG&G 1995b). Depending on the season, unsaturated areas may occur within the plume (DOE 1996b, EG&G 1995b, RMRS 1996a). At seep SW059, groundwater containing low levels of VOCs with trace amounts of radionuclides discharges at a rate averaging less than 0.5 gallons per minute. The seep water is collected, stored in a tank near the seep, then transported and treated at the Building 891 Consolidated Water Treatment Facility (DOE 1995, RMRS 1996b). The approximate quantities of water collected from seep SW059 are listed in Table 1. The Spring of 1995 was exceptionally wet, including a 12 year storm event with 25+ year runoff due to saturated conditions.

Table 1. Quantity of Water Collected from SW059 by Quarter

Quarter	Gallons/quarter
July-Sept. 1995	32,526
Oct.-Dec. 1995	16,930
Jan.-Mar. 1996	17,285
April-June 1996	18,775
July-Sept. 1996	13,095
Oct.-Dec. 1996	11,605
Jan.-Mar. 1997	7,268

Based on historical flow rates from SW059, available hydrogeologic data, and typical rates for other groundwater drains on Site, the groundwater flow for the Mound Site Plume was calculated to be 0.1 to 2 gallon per minute for the assumed 250 foot length of groundwater interception. This flow rate assumes that water will not be depleted from South Walnut Creek, recharge to the hill side is not significantly altered from current conditions, field data is representative of the actual conditions, and that groundwater interception will occur between geoprobe holes 10297 and 11097 (Figure 1). During extended periods of below average precipitation, it is possible that the flow will effectively approach zero (Tom Sale, written correspondence, April 1997).

Based on the water levels from existing wells and the recently installed, temporary wells, the distal end of the Mound Site groundwater plume extends from just west of SW059 to the vicinity of boring 10997 (Figure 1). Photographs taken during wet periods indicate the extent of the groundwater plume. Two lines of seeps are developed between the Mound Site and SW059, but are limited to the western side of the area. The upper seep line is probably related to the subcropping Number One Sandstone; the lower seep may be related to the subcropping saturated area (DOE 1995, RMRS 1996a).

Where present, groundwater was found in the colluvium and/or in the weathered bedrock just below the colluvial/bedrock contact. Water levels primarily ranged from 1 foot to 13 feet below ground surface. However, along the eastern road (Figure 1), up to 13 feet of fill material is present over the colluvium, and the water level is approximately 30 feet below ground surface.

Both the EPA investigation and the recent Site investigation discovered areas within the plume that were dry or did not produce groundwater. At location 11297, the soil was dusty indicating that no groundwater was present. At the other non-producing locations, the claystone was cohesive, indicating that moisture was present. It is most likely that these areas are very low flow zones, where groundwater is present at the elevation of the surrounding water table. However, the recovery rate for the well is so low that it appears the wells are dry. Additional tests are on-going to determine whether this is an accurate assessment of these wells.

The highest groundwater levels were measured near the central portion of the plume, particularly at 10497 where the water level was one foot below ground surface. Standing water was observed in this area during the field investigation, probably due to this high water table. The water level generally declined towards the east and west edges of the plume. Location 10397 in the road bed west of SW059 contained significant quantities of water consistent with the theory that groundwater preferentially flows through the road fill. The quantity of water present generally declines to the east and west. Location 10197, the furthest west, required numerous attempts before it finally yielded sufficient water for a VOC analysis (120 ml).

3.4 Mound Plume Site Contamination Data Summary

Based on the results of the recent investigation (spring 1997), and data from the existing groundwater monitoring wells, tetrachloroethene is the predominant contaminant found in soil and groundwater at the Mound Site, with a highest historic groundwater concentration of 528,000 ug/l in Well 0174 (Figure 1). Concentrations decrease towards South Walnut Creek, which supports the Mound Site as the source area for the contaminants seen in this plume. Historical groundwater data from the Mound Site source area are summarized in Table 2, with the wells shown on Figure 1.

Table 2. Maximum Mound Site Source Area Groundwater Sampling Results Summary (from DOE 1996b).

Contaminant	Well 0174	Well 02191	Well 02291	Well 1987	Well 2087
Tetrachloroethene	528,000 ug/l	980 ug/l	3,400 ug/l	2,300 ug/l	370 ug/l
Trichloroethene	18,000 ug/l	67 ug/l	410 ug/l	110 ug/l	5 ug/l

Note: all values are maximum observed concentrations, regardless of date collected.

The most commonly detected groundwater contaminants are tetrachloroethene and trichloroethene. Carbon tetrachloride is detected only on the eastern side of the plume; at seep SW059 and at location 10397 (Figure 1). This may indicate that there is a separate source of contamination in the road fill. Both dichloroethene and vinyl chloride are present in the distal portion of the plume, and are degradation products of trichloroethene and tetrachloroethene (RMRS 1996a, DOE 1995, DOE 1996b).

Table 3 provides the analytical data for the constituents in Seep SW059 above the RFCA Tier II action levels or Segment 5 Stream Standards during 1995 (see Section 6.0 Applicable Or Relevant And Appropriate Requirements).

Table 3. SW059 Constituents Greater than Tier II Groundwater Action Levels or Segment 5 Stream Standards in 1995.

Group Code	Chemical Name	Unit	Min. Value	Max. Value	Avg. Detect	Num. Of Detects	ALF GW Tier I Action Levels	ALF GW Tier II Action Levels	Seg. 5 Action Levels	GW Back-ground M2SD	SW Back-ground M2SD	Notes
Dis. Metals	Antimony*	ug/l	11.89	16	13.56	8	600	6		42.2	105098	Above Tier II
Dis. Metals	Manganese*	ug/l	2.2	339.15	269.78	17	18,300	183		207.5	2537	Above Tier II
Dis. Metals	Thallium*	ug/l	4.6	4.6	4.6	1	200	2		713.9	2276	Above Tier II
Tot. Metals	Antimony*	ug/l	11.3	11.3	11.3	1	600	6	6	43.6	13361	Above Tier II and Segment 5
Tot. Metals	Iron*	ug/l	48.5	12,100	1,013	15			1000	23269	11239	Above Segment 5
Tot. Metals	Manganese*	ug/l	258	1,440	386.78	15	18,300	183	1000	467	2020	Max value above Tier II and Seg. 5
Tot. Rads	Americium-241	pCi/l	0.25	0.25	0.25	1	15	0	0.15**	0.04	0.02	Above Tier II and Segment 5
Tot. Rads	Gross Beta	pCi/l	3.1	28	8.09	14			19	131.6	21.8	Max value above Segment 5
Tot. Rads	Plutonium-239/240	pCi/l	0.01	0.18	0.05	9	151	0	0.15	0.05	0.02	Max value above Tier II and Segment 5
Tot. Rads	Uranium, Total	ug/l	25	25	25	1			10	NA	1.63	Above Segment 5
Tot. Rads	Uranium-233,-234	pCi/l	3.4	3.4	3.4	1	298	3		85.3	1.59	U233+D only Above Tier II
Tot. Rads	Uranium-238	pCi/l	3.02	3.02	3.02	1	77	1		60.3	1.23	Above Tier II
VOA-524.2	Carbon Tetra-chloride	ug/l	3	130	33.94	6	500	5	5			Above Tier II and Segment 5
VOA-524.2	Chloroform	ug/l	2	25	8.75	16	10,000	100	6			Above Segment 5
VOA-524.2	Cis-1,2-Dichloro-ethene	ug/l	4	41	16.56	16	7,000	70	70			1,2 Dichloroethene (total)
VOA-524.2	Methylene Chloride	ug/l	0.1	18	2.74	7	500	5	5			Above Tier II and Segment 5
VOA-524.2	Tetrachloro-ethene	ug/l	1	54	11.56	16	500	5	5			Above Tier II and Segment 5
VOA-524.2	Trichloro-ethene	ug/l	1	76	16	16	500	5	5			Above Tier II and Segment 5
VOA-524.2	Vinyl Chloride	ug/l	0.7	3	1.68	4	200	2	2			Max value above Tier II and Segment 5

Note: Metal action levels are for dissolved metals only but were applied to total metals for this table.
* Metals below background concentrations
** Americium 241 Segment 5 Standard is 0.05 pCi/l until January 1998.

Soil and groundwater samples were collected during the Spring 1997 pre-remedial investigation to support the design of the collection and treatment system. The analyses indicate that the highest concentrations in the plume are trichloroethene (TCE) at 844.5 ug/l, tetrachloroethene

(PCE) at 260.8 ug/l, and cis-1,2 dichloroethene at 808 ug/l seen at location 10797, directly downgradient of the Mound Site source area (Figure 1). Table 4 summarizes the results of this investigation.

Table 4. Groundwater Contaminants of Concern from recent investigation results (in ug/l).

	Minimum	Maximum	Average	Number of Detects	Tier I ALF	Tier II ALF
Vinyl Chloride	nd	55.0	13.0	5	200	2
1,1 Dichloroethene	nd	94.2	18.0	8	700	7
cis 1,2 Dichloroethene	nd	808.0	169.0	9	7000	70
Carbon Tetrachloride	nd	6.6	0.8	1	500	5
Chloroform	nd	177	17	6	10000	100
trichloroethene	nd	844	195	9	500	5
tetrachloroethene	nd	261	66	8	500	5
Methylene Chloride	nd	18	4	3	500	5
Americium 241*	0.25	0.25	0.25	1	15	0.15
Gross Beta*	3.1	28	8	14		19**
Uranium 234*	3.4	3.4	3.4	1	298	3

* Insufficient water to obtain radiological analyses, data is from SW059
** Segment 5 Stream Standard

3.5 SW059 Background Comparison for Metals and Radionuclides

The latest readily available analytical data, for the 1995 sampling year, were reviewed for SW059. A summary of the data, including minimum, maximum, and average concentrations, the 95% upper confidence limit, number and percent detects, and relevant action levels and background levels are reported in Table 3. The value assigned to non-detects is one-half the reported detection limit.

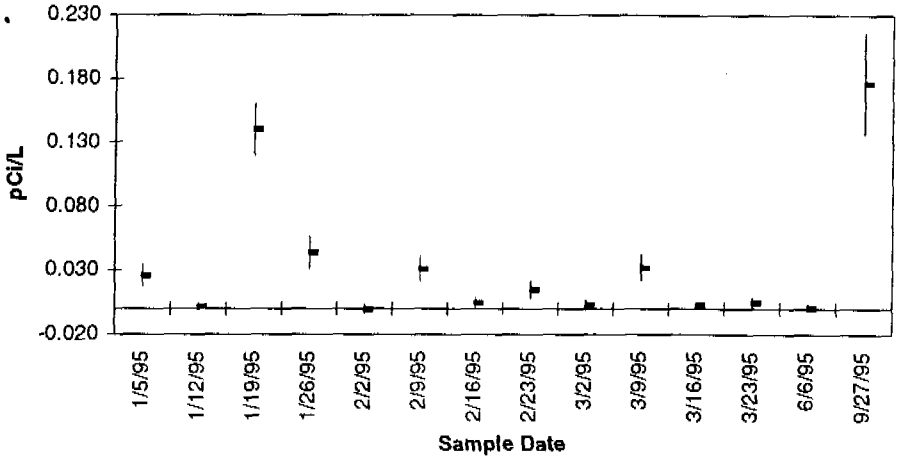
Under the RFCA exceedances of groundwater and surface water action levels are determined by comparing the each data value to the action level and then to the appropriate background concentration. A value is not considered an exceedance unless it is greater than both the action level and the background value. The maximum values for six metals and five radionuclides were above the Tier II groundwater action level or the segment 5 surface water action level.

For filtered antimony and manganese, and for unfiltered antimony, iron, and manganese, the maximum detected values are below background values for both seep water and surface water, as reported in the Background Geochemical Characterization Report (DOE 1993). Thallium had

one B qualified result, where the thallium was also detected in the blank (uncontaminated) sample, that was considered a detect. The other 93% of the samples analyzed were nondetects. The 95% upper confidence limits of the means for all metals were below the background mean plus two standard deviations (M2SD). Therefore, none of these metals are considered to be chemicals of concern.

For unfiltered plutonium-239/240, two of the 14 analyses had levels at or near the groundwater or surface water action levels. As shown in Figure 2, there is no significant temporal pattern or trend in the data. The two higher activities are not considered representative of the seep water and appear to be outliers. Therefore, plutonium is not considered a contaminant of concern.

Figure 2 -- SW059 Pu Concentrations With Error Bars



Four other radionuclides, americium-241, uranium-233/234, uranium-235, and uranium-238, were sampled only once or twice in 1995. Of the four, three had values above Tier I action levels for groundwater and also above background for seep water. For example, americium-241 had one value each of 0.0 and 0.25 pCi/L. The single analysis for total uranium also exceeded the seep water background value (Table 3). Additional historical data will be analyzed for all of these radionuclides to verify that these radionuclides are not above background levels.

The maximum values for both gross alpha and gross beta were above the Segment 5 surface water action levels. Only one of 14 analyses was above the surface water action level for gross

alpha. This single value appears to be an outlier, and is well below the background values for both seep water and groundwater (Table 3). Only two of 14 gross beta values are above the surface water action levels, all other results are well below the action level and are below the surface water background value. Neither gross alpha nor gross beta exceed the action levels on a regular basis. Therefore, neither gross alpha nor gross beta are considered a contaminant of concern.

4.0 PROJECT APPROACH

A downgradient capture system will be installed near South Walnut Creek to intercept contaminated groundwater and to minimize impacts to surface water. A subsurface groundwater collection system will be coupled with a passive reactive metals treatment system to treat contaminated groundwater from the Mound Site plume to the Segment 5 action levels specified in the Rocky Flats Cleanup Agreement (RFCA). The downgradient capture system was chosen as the best remediation method following an evaluation of other more traditional options in the Groundwater Conceptual Plan (RMRS 1996a). The passive treatment system was chosen as it effectively treats VOCs and radionuclides to below action levels at a lower operations and maintenance cost than other treatment options. The treated water will then be discharged to surface water. The project will be conducted in accordance with RFCA, DOE Orders and RFETS policies and procedures. The project will also utilize lessons learned from previous accelerated actions and will remediate one of the top ten IHSS sites at RFETS.

4.1 Proposed Action

The Mound Site Plume contains chlorinated organic contamination, americium and uranium in excess of Action Level Framework (ALF) Tier II level concentrations defined in RFCA. Based on the available data, to capture the contaminant plume, the groundwater collection system will extend from the western road approximately 250 feet to the east (Figure 1).

The variable elevation of the bedrock surface and the similarity between the clay-rich colluvium and bedrock makes it difficult to install a collection system keyed a certain depth into bedrock. Since the clayey colluvium and bedrock have similar properties, it is probably not necessary to

key the collection system into bedrock to get effective collection of the contaminated groundwater. Therefore, the collection system will be installed at a variable depth of approximately 8 to 15 feet across the site, at least 6 inches, but up to several feet, into claystone, without regard to whether this is colluvium or bedrock.

Standard excavating equipment and bracing technology will be used, as required, to install a funnel (impermeable barrier) and gate (treatment) system keyed into the underlying claystone for flow cut-off. Contaminated groundwater will be collected, treated in a series of cells containing reactive iron filing to remove VOCs and radionuclides, and discharged to surface water.

Excavated soil will be stockpiled outside of and within the trench used to construct the funnel and gate system, and will be used to backfill the trench once the funnel and gate system has been installed. After installation of the funnel and gate system, reclamation of the collection/treatment area will be performed to return these areas to natural conditions. The existing seep SW059 collection system will continue to operate to the extent practical, until the new system is operational. However, it is likely that installation of the funnel and gate system will require decommissioning of the existing system. When the present system is no longer functioning, periods of non-collection of SW059 water will occur.

4.1.1 Installation of Funnel and Gate System

Conventional excavation/trenching techniques will be used to install the funnel and gate system. Silt fences will be installed downgradient of the excavation to control potential release of sediment to the drainages. A portion of the trench will be over-excavated and used to stockpile soil that will be used to backfill the trench. A horizontal groundwater-collection line will be installed on the upgradient side of the barrier. Filter pack or pea gravel will be installed from the top of the claystone to the level of the horizontal collection line. The trench will then be backfilled. Excess fill will be spread over the top of the collection system.

During soil handling activities that result in dust generation, dust minimization techniques, such as water sprays, will be used to minimize suspension of particulates. In addition, excavation operations will not be conducted during periods of sustained high winds. The RFETS Environmental Restoration Field Operations Procedure FO.01, Air Monitoring and Dust Control,

will be incorporated into the project. Air monitoring for VOCs, particulates, and radioisotopes will be performed during excavation and backfill activities.

Based on the results of the soil analyses, radiological monitoring of the soils will be performed if required to protect workers, the public, and the environment in accordance with 10 CFR 835 and the RFETS Radiological Controls Manual (K-H, 1996). If unexpected levels of radioactivity are encountered in the soil, such as greater than three times background, the soils will be segregated and further sampling and evaluation will be performed to compare radioisotopic concentrations with RFCA subsurface action levels.

4.1.2 Treatment and Discharge

A reactive metals treatment system will be used to degrade dissolved halogenated organic chemicals and remove radionuclides from groundwater. The reactive metal media works by inducing conditions that cause substitution of hydrogen for chlorine in the chlorinated VOCs. The end-products of the process are completely dehalogenated hydrocarbons and non-toxic salts. Examples of end-products of chlorinated VOCs degraded by this process are ethene, ethane, and chloride ions. Radionuclides are removed by undergoing a reduction and/or absorption process.

The treatment system will be designed based on the results of laboratory treatability studies conducted by Enviromental Technologies, Inc. (ETI), the patent holder for the reactive iron filings technology, and by Sandia National Laboratories (Sandia) for radionuclide removal. ETI's and Sandia's recommendations on the volume of reactive media and retention times required to meet the Segment 5 action levels will be incorporated into the final design of the treatment system.

For the laboratory treatability study, ETI used uncontaminated groundwater from RFETS and spiked it to the maximum contaminants levels expected for the Mound Site, 903 Pad/Ryan's Pit and East Trenches Plumes. Initial concentrations used in the column testing and concentrations in the treated effluent are shown in Table 5. All VOCs, with the exception of methylene chloride (dichloromethane) were removed to below Segment 5 Action Levels.

The concentrations of methylene chloride in the Mound Site Plume (Table 4) are already not detectable or low level, and Segment 5 Action Levels would be met. However, a granular

activated carbon canister may be specified in the treatment system design to be used as a post treatment system to ensure that any residual levels of methlyene chloride are removed to below Segment 5 Action Levels, and also to treat higher than expected flow volumes that may occur in very wet years (such as occurred in 1995).

Table 5. Results of ETI Bench Scale Testing - Connelly Iron

Compound	Influent Conc. (ug/L)	Effluent Conc. (ug/L)	Segment 5 Action Level (ug/L)
Carbon Tetrachloride	1,004	nd	5
Trichloromethane	110	nd	8
Dichloromethane	111	105	5
Tetrachloroethene	5,496	nd	5
Trichloroethene	5,250	nd	5
Cis-1,2-dichloroethene	64	nd	70
1,1-Dichloroethene	318	nd	7
Vinyl Chloride	102	nd	2
1,1,1-Trichloroethane	37	nd	200

nd = non detect

4.1.3 Compliance Monitoring System

The objective of compliance monitoring of the groundwater collection/treatment system is to show the effectiveness of the system in meeting the project objectives. Monitoring consists of two parts: 1) monitoring the effectiveness of the treatment system, and 2) monitoring the effectiveness of the groundwater interception system.

4.1.3.1 Treatment Monitoring

The effectiveness of the iron filings at dehalogenating chlorinated VOCs and removing radionuclides in groundwater will be evaluated by comparing VOC and radionuclide concentrations in water entering and leaving the treatment system. One access point will be installed to allow sampling inflow to the treatment system. A second access point will be installed to allow sampling of the treatment system effluent. A flow indicating device will also be installed in the treatment system discharge line. Sampling type and frequency are listed in Table 6.

4.1.3.2 Groundwater Monitoring

The effectiveness of the groundwater collection system will be assessed by monitoring the elevation of the water table. Piezometers will be installed upgradient and downgradient of the containment wall to measure water levels. The sampling frequencies are listed in Table 6.

4.1.3.3 Laboratory Methods

VOC samples will be analyzed by EPA Method 8260. Radiometric, isotopic analyses will be performed to determine the concentrations of americium, plutonium, total uranium, gross alpha and gross beta. Data will be validated and assessed for usability prior to use. Data will be reported quarterly the first year, then annually thereafter.

Table 6. Schedule for Water Quality Sampling and Water Table Measurements

Task	Month 1	Months 2-12	Subsequent Years
Treatment System Effluent	Weekly	Quarterly	Semi-Annually
Downgradient Water Quality	Quarterly	Quarterly	Semi-Annually
Hydraulic Head	Weekly	Quarterly	Semi-Annually

4.1.4 Site Reclamation

At the completion of the installation of the collection and treatment system, the areas disturbed during construction will be revegetated. Radiological surveys of the equipment will be performed per the RFETS Radiological Control Manual (K-H 1996) prior to release from RFETS. Excavation equipment will be decontaminated. Typical decontamination methods include pressure washing and hand washing. Revegetation will be performed in accordance with guidance from Site ecologists using appropriate seed mixtures.

4.2 Worker Health and Safety

The nature of the contaminants present at the Mound Site cause this project to fall under the scope of the Occupational Safety and Health Administration construction standard for Hazardous Waste Operations and Emergency Response, 29 Code of Federal Regulations (CFR) 1926.65. Under this standard, a Site-Specific Health and Safety Plan (HASP) will be developed to address the safety and health hazards of each phase of site operations and to specify the requirements and procedures for employee protection. In addition, DOE Order 5480.9A, Construction Project

Safety and Health Management, applies to this project. This order requires the preparation of Activity Hazard Analyses (AHAs) to identify each task, the hazards associated with each task, and the controls necessary to eliminate or mitigate the hazards. The AHAs will be included in the HASP.

This project could expose workers to physical, chemical, and potentially to low levels of radiological hazards. The physical hazards include those associated with excavation activities, use of heavy equipment, noise, heat stress, cold stress, and work on uneven surfaces. Physical hazards will be mitigated by appropriate use of personal protective equipment (PPE), engineering, and administrative controls. Chemical hazards will be mitigated by the use of PPE and administrative controls. Appropriate skin and respiratory personal protective equipment will be worn throughout the project. Routine VOC monitoring will be conducted with an organic vapor monitor for any employees who must work near the contaminated soil (i.e. soil sampling or excavation personnel). Based on employee exposure evaluations, the Site Health and Safety Officer may downgrade personal protective equipment requirements, if appropriate.

If radiological controls are required, based on the soil samples collected but results not yet received, the HASP will include project "radiological hold points", such as radioactive levels in soil greater than three times background, encountering unexpected contaminated debris, or removable contamination above limits. Radiation monitoring will be included as necessary in the HASP per the RFETS Radiological Controls Manual (Kaiser-Hill, 1996).

If field conditions vary from the planned approach, an AHA will be prepared for the existing circumstances and work will proceed according to the appropriate control measures. Data and controls will be continually evaluated. Field radiological screening will be conducted using radiological instruments appropriate to detect surface contamination and airborne radioactivity. As required by 10 CFR 835, Radiation Protection of Occupational Workers, applicable implementing procedures will be followed to insure protection of the workers, co-located workers, the public, and the environment. The HASP describes the air monitoring equipment to be used to monitor for VOCs, particulates, and radiation. Finally, dust minimization techniques will be used to minimize suspension of contaminated soils.

4.3 Waste Management

Analytical data from soil sampling along the collection system alignment is expected to indicate that radionuclides are not present in soils in the area. When the impermeable barrier is excavated, clean soil will be stockpiled adjacent to the trench for use as backfill or to regrade/revegetate the area. Any soil in the trench containing low-levels of VOCs will be staged on a bench within the trench and used as backfill in the trench bottom.

Any water that collects in the trench during trench excavation will be collected in a sump and pumped to a tank or tanker truck for treatment in the Consolidated Water Treatment Facility. Any sediment trapped in the sump, tanks, or tanker truck will be segregated, mixed with backfill material and returned to the trench.

The treatment system will be designed so that there will be an initial, removable cell containing iron filings or iron foam, to remove any radionuclide contamination in the groundwater. The cell will be designed to have an adequate residence time to absorb the radionuclides. This material will require disposal as a low level or low level mixed waste. The second cell will contain iron filings to remove organics only. After this material is exhausted, it will be analyzed and then is expected to be recycled and sold as scrap metal. It is anticipated that the iron filings will require replacement every five to ten years.

Any piping or equipment from the existing SW059 collection system will be pressure washed to meet the debris treatment requirements (see Section 6.2.7), and disposed as scrap metal.

5.0 NEPA VALUES

Incorporation of NEPA values into Site decision documents is mandated in the Rocky Flats Cleanup Agreement (RFCA) (¶95). Decision documents tied to Interim Measures/Interim Remedial Actions, such as this one, are included in that requirement by RFCA (¶118). Accordingly, this section provides a description of potential environmental impacts which may be associated with the remediation of groundwater associated with the Mound site.

5.1 Soils and Geology

The collection system could be as long as 250 feet. Excavation for installation of the collection system may extend to claystone. Minor impacts to the claystone could occur for the full length and breadth (up to approximately four feet) of the collection system.

Soils will be disturbed for the full length and breadth of the excavation; the natural soil profile will be eliminated and replaced by a more homogeneous soil mixture when the excavated material is backfilled in the trench. The possibility that backfilling of excavated soil could affect the ability of the disturbed area to support revegetation will be mitigated by use of topsoil, imported if necessary and approved by Site ecologists in accordance with Site revegetation procedures.

It is possible that storm water could carry off excavated or in-place soil during the project. However, a silt fence will be installed downgradient of the work site to prevent transport of sediment during construction, and revegetation will provide erosion control after installation is complete.

5.2 Air

The project poses little potential for significant release of either hazardous or radiological contaminants to the air during excavation, staging, storage, and backfilling of soil based on the low levels of contaminants expected to be present in the soil.

The Kaiser-Hill Air Quality Management group will analyze project data to estimate quantities of contaminants that could be released during construction and operation of the project. The results of this analysis will be used not only to assure compliance with applicable air quality regulations but, together with other information, to identify appropriate measures to take to protect the health of workers, such as wearing appropriate personal protective equipment. Such measures, if necessary, will be identified in the project's Health and Safety Plan. In addition, appropriate dust suppression measures will be implemented to minimize release of particulate matter. Because all regulatory requirements and health-based standards will be complied with, no adverse effects are expected to air quality, and there will be no impact to colocated workers

and the public from project-related air emissions. No radioactive air emissions are expected during either construction or operation of the project.

5.3 Water

The objective of the project is to improve water quality by removing contaminants from groundwater. Because there would a minor change in the quantity of water discharged in the immediate area due to the addition of flow from SW059, and a small change in the discharge point, there are not expected to be changes in water quantity-related indicators.

The barrier will intercept groundwater flow for its length for the life of the project. Because of the small water quantities involved and the short distance between the barrier and South Walnut Creek (between 10 and 120 feet) where the water would surface normally, effects to the groundwater system are expected to be minimal.

As indicated in section 5.1, silt fencing will be installed downgradient of the work area to minimize the possibility of surface water carrying potentially-contaminated or sediment-bearing soil off the work site. Because of the silt fence and use of the pump and treatment system used to dewater the excavation, storm water runoff from the project is not expected to have adverse impacts.

Discharge of the treated water to South Walnut Creek is expected to improve water quality as water entering the stream will have significantly less contamination than at present.

5.4 Human Health

Radionuclide Air Emissions Based on the background comparison (section 3.5) radionuclides are not seen above background levels. Consequently, radionuclides are not expected to be encountered and so should not present a issue for human health.

Other Possible Effects to Human Health Other possible effects to human health include industrial accidents that can occur at any construction site where there is excavation using heavy equipment. The project's Health and Safety Plan and Field Implementation Plan will describe the

steps to be taken to make the project as safe as possible for workers. (See also section 5.13, Environmental Effects of Accidents.)

5.5 Flora and Fauna

The project will adversely effect up to about 15,500 sq. ft., or about one-third of an acre, of vegetation during construction of the collection and treatment facilities. This impact will be temporary since disturbed areas will be revegetated as directed by Site ecologists. None of the area to be disturbed by the remediation activities supports or provides habitat for threatened or endangered plant or animal species, or species of concern, nor does it contain unique or unusual biological resources. The area is, however, upstream of a known population of Prebles meadow jumping mice. Use of silt fencing and Site procedures related to excavation are expected to minimize the possibility of adverse downstream effects. As a result, no impacts on downstream flora or fauna are expected.

The remedial activities will remove groundwater from the area immediately down-gradient of the barrier for the life of the project and potentially dry up a small wetland fed, at least in part, by water that daylights at seep SW059. It is also possible that construction activities could destroy the wetland. The wetland is approximately 100 sq. ft. Mitigation of this adverse effect will, if necessary, be negotiated with the Environmental Protection Agency. Mitigation, if required, could take the form of a credit against the Site's Wetland Mitigation Bank.

Due to sparse vegetative cover, its proximity to the industrial area, and its location inside the perimeter fence, the project site is used only incidentally by large mammals such as the deer and coyotes that frequent the area. Rabbits, voles, mice, and other smaller mammals as well as snakes and other reptiles would be expected to forage around or inhabit the project site. No deep-burrowing mammals (such as prairie dogs) inhabit the area. Use of the area for foraging will necessarily be interrupted during remediation, but would be expected to resume after revegetation activities are complete. It is expected that, at the conclusion of revegetation, the project site will regain its natural appearance with regard to both land contour and vegetative cover. Surveys of the area necessary for compliance with the Migratory Bird Treaty Act will be conducted by Site ecologists prior to beginning field activities.

DOE will, as required by the Endangered Species Act, confer with the U. S. Fish and Wildlife Service to confirm that the mitigation steps described above are sufficient.

5.6 Historic Resources

No buildings or other historic or potentially historic items are expected to be encountered, disturbed, or affected by Mound site groundwater remediation activities.

5.7 Visual Resources

The remediation activities would result in temporary, moderate visual impacts while the project is in progress. Excavation, stockpiling of dirt and debris, and the presence of excavation equipment would change the immediate site into a construction site rather than a "natural" area. This appearance would not, however, be in sharp contrast to the industrial buildings and activities to the west. Furthermore, construction activities are expected to last less than a month, after which, as indicated above, the area would graded and revegetated to have an appearance similar to the surrounding area.

5.8 Noise

Remediation activities will result in locally-increased noise levels typically associated with other construction projects: heavy equipment operation, other machinery-related noise, *etc.* Such impacts will be minor and temporary, consistent with other noise levels at the Site, not noticeable more than a few hundred yards from the area, and confined to the Site. Appropriate hearing protection will be supplied for project personnel if called for in the project's Health and Safety Plan.

5.9 Cumulative Effects

In general, the adverse effects of Mound Site groundwater remediation activities are expected to be minimal and temporary while the beneficial effects (removal of contamination) will be long-term. Remediation of the Mound groundwater is part of the overall mission to clean up the Site and make it safe for future uses. The cumulative effects of this broader, Site-wide effort are described in the *Cumulative Impacts Document*, currently in preparation by DOE. That document describes the short- and long-term effects to a variety of resources from the cleanup mission, and is included in this decision document by reference.

5.10 Unavoidable Adverse Effects

Some temporary, adverse effects will necessarily occur because of the remediation activities. Some vegetation will be destroyed; soil conditions in excavated areas will be changed; noise levels will increase slightly and temporarily; some very minor quantities of air pollutants will be released to the atmosphere; fuels and other resources will be consumed; and some small mammals or reptiles may be temporarily dislocated.

5.11 Short-term Uses Versus Long-term Productivity

The project area is currently vacant, *i.e.*, there is no surface use of the land. Remedial activities will improve water quality, and will open the surface area to the potential for other, possibly more productive, uses after Site closure activities are completed.

Water that is normally collected at SW059 and treated would not be collected during the construction period. If water collects in the excavation, it will be collected and treated. Because of the small quantity of water normally collected at SW059, and the very low concentrations of contaminants, environmental effects of two to four weeks of not collecting are expected to be negligible.

5.12 Irreversible and Irretrievable Commitments of Resources

Remediation will irretrievably consume fuels, small quantities of certain materials used in the treatment of water, money and labor. None of these resources will be consumed in quantities that are significant relative to their consumption elsewhere across the Site.

5.13 Environmental Effects of Accidents

The project carries only that risk of accidents that would be associated with other, similar construction projects. Radionuclides and hazardous materials are expected in quantities below those that could result in accidents and lead to adverse environmental consequences during construction or operation of the project. A project-specific Health and Safety Plan and Activity Hazardous Analysis will be prepared to identify and control hazards that may be encountered. Implementation of the requirements of these documents will minimize the possibility, and potential consequences, of accidents.

6.0 APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

Modifications to RFETS IM/IRAs must attain, to the maximum extent practicable, federal and state applicable or relevant and appropriate requirements (ARARs). For that reason, the substantive attributes of the federal and state ARARs must be identified. In addition, RFCA recognizes section 121(e)(1) of Comprehensive Environmental Response Compensation and Liability Act (CERCLA), so that accelerated actions conducted in the buffer zone may waive the procedural requirement to obtain federal, state, or local permits. (RFCA ¶16.a.).

The groundwater treatment unit and the point source discharge will be located in the buffer zone. For each permit waived, RFCA requires identification of the substantive requirements that would have been imposed in the permit process (RFCA ¶17). Further, the method used to attain the substantive permit requirements must be explained (RFCA ¶17.c.). The following discussion is intended to compliment other descriptions provided in this IM/IRA Modification in a manner that satisfies the RFCA permit waiver requirements.

6.1 Chemical-Specific Requirements and Considerations

6.1.1 Colorado Water Quality Standards

For the VOC contaminants of concern, the site-specific Colorado Water Quality Standards for Segment 5 of Big Dry Creek are applicable to the segment of South Walnut Creek that will receive the treated discharge. These water quality standards are also relevant and appropriate to developing a design that will capture, to the maximum extent practicable, the groundwater that exceeds the surface water quality ARARs. (See 5 CCR 1002-8, Classification and Numeric Standards South Platte River Basin, Section 3.8.0, Segment 5, Big Dry Creek). The surface water quality standards are presented in Table 7.

Table 7. Big Dry Creek Segment 5 Surface Water Quality Standards

Carbon tetrachloride	5 ug/l[1]
Chloroform (trichloromethane)	100 ug/l[2]
1,1-Dichloroethene	7 ug/l[1]
cis-1,2-Dichloroethene	70 ug/l[2]
Methylene chloride (dichloromethane)	5 ug/l[2]
Tetrachloroethene	5 ug/l[1]
1,1,1-Trichloroethane	200 ug/l[2]
Trichloroethene	5 ug/l[1]
Vinyl chloride (Chloromethane)	2 ug/l[2]

[1]Temporary Modification, not to be applied from 4/97 to 1/98
[2]Basic Standard

6.1.2 National Emissions Standards for Hazardous Air Pollutants (NESHAP)

40 CFR Part 61, Subparts A and H (Colorado Code of Regulations (CCR) 5 1001-3, Regulation No. 8, Part A, Subparts A and H) are the applicable NESHAP. This regulation requires limitation of RFETS radionuclide emissions to meet an annual public dose (to offsite member of the public) standard of 10 millirem (mrem); monitoring of significant emissions points; EPA/CDPHE notification and approval (state permit) prior to construction or modification of radionuclide sources with emissions exceeding a 0.1 mrem threshold; and annual reporting of the RFETS Effective Dose Equivalent for each calendar year to demonstrate compliance with the 10 mrem standard.

Due to low concentrations of radionuclides in groundwater surface and subsurface soils, and because the proposed remediation is a CERCLA project, EPA/CDPHE notification and approval are not required. The estimated dose from the project is not expected to exceed the 0.1 mrem notification threshold (See 40 CFR §61.93 (4)). Records will be kept, as needed, of project parameters sufficient to estimate the dose for annual compliance reporting.

6.2 Action-Specific Requirements and Considerations

The following action-specific requirements and considerations were evaluated specific to the Mound Site Plume Decision Document:

- Definition of Remediation Waste
- Identification and Listing of Hazardous Wastes

- Land Disposal Restrictions
- Construction Waters
- Soil Staging
- Temporary Unit Tank and Container Storage
- Particulate, VOC and Hazardous Air Pollution Emissions
- Debris Treatment
- Water Treatment Unit

6.2.1 Remediation Waste

In RFCA remediation waste is defined as all:

> *(1) Solid, hazardous, and mixed wastes;*
>
> *(2) All media and debris that contain hazardous substances, listed hazardous or mixed wastes or that exhibit a hazardous characteristic; and*
>
> *(3) All hazardous substances.*
>
> *generated from activities regulated under this Agreement as ... CERCLA response action.... (See RFCA ¶25.bf.).*

A parallel definition is also found in 40 CFR §260.10. As such, the definition of remediation waste is applicable to all wastes, environmental media (soil, groundwater, surface water, stormwater and air) and debris generated in conjunction with this action.

6.2.2 Identification and Listing of Hazardous Wastes

Requirements governing the identification and listing of hazardous wastes are applicable to this action. (See 40 CFR Part 261). Based upon process knowledge and characterization data from the Mound Site, the contaminated groundwater and soil that will be addressed during this action also contains F001 spent solvents or still bottoms from degreasing that were released from the drums during waste storage. For that reason, the F001 hazardous waste listing is applicable to any groundwater, soil, or debris that contains solvent constituents.

6.2.3 Wastewater Treatment Unit

The Clean Water Act, NPDES governs the discharge of pollutants from any point source into the waters of the United States. (See 40 CFR §122.1(b)). The establishment of a wastewater treatment unit requires an NPDES permit waiver. Therefore, the discussion in this section is provided to satisfy ¶17 of RFCA.

As noted earlier, the Table 7 surface water quality standards (see section 6.1.1) are relevant and appropriate to the wastewater treatment unit discharge. No NPDES action-specific ARARS addressing the design or operation were identified.

6.2.4 Land Disposal Restrictions

The Land Disposal Restriction (LDR) levels for wastewater or non-wastewaters are applicable to any remediation waste that exhibits a hazardous waste characteristic or contains listed hazardous waste if it is actively managed outside of the area of contamination.

6.2.5 Construction Waters

Wastewaters generated during construction activities will be collected, then transferred to the Consolidated Water Treatment Facility for treatment. If these remediation wastewaters contain listed RCRA hazardous wastes or if the remediation wastewaters exhibit a RCRA characteristic, the RCRA hazardous waste requirements would not be applicable or relevant and appropriate during treatment because these remediation wastewaters are CERCLA wastes being treated in a CERCLA treatment unit. The Consolidated Water Treatment Facility will treat the remediation wastewater to meet applicable surface water quality standards under NPDES ARARs framework.

Any waste generated at the Consolidated Water Treatment Facility as the result of treatment of a listed remediation waste will be assigned the corresponding F001 hazardous waste code and managed in accordance with applicable RCRA ARARs. Wastes generated as a result of the treatment of remediation wastewater will also be evaluated to determine if they exhibit a hazardous characteristic.

6.2.6 Soil Staging

The movement, temporary staging and replacement of excavated soils that contain F001 listed hazardous wastes will not trigger LDRs (see 55 FR 8760) as long as these activities occur within the Mound Site Plume area of groundwater contamination.

As noted earlier, uncontaminated or marginally contaminated soils that are excavated when the system is installed will be stockpiled adjacent to the excavation. Consistent with the General Stormwater Permit for Constructions activities, Best Management Practices (BMPs) to control erosion have been considered and will be implemented. Common BMPs include silt fences or hay bales. (See 57 FR 41176). Deeper, more contaminated soils will be benched within the excavation. This will ensure that sediments and any chemical contamination are contained within the working area.

6.2.7 Temporary Unit (TU) Tank and Container Storage

Tanks and containers may be used during construction and startup to maintain groundwater that contains F001 hazardous wastes. The establishment of TUs may require a permit exemption if any of the tanks or containers are used for longer than 90 days. Therefore, the discussion in this section is provided to satisfy ¶17 of RFCA.

40 CFR §264.553 provides that temporary tanks and containers used for the storage or treatment of hazardous remediation wastes may be subject to alternative design, and operating and closure requirements as long as the requirements are protective of human health and the environment (See 40 CFR §264.553(a)). The TU must be located within the facility boundary and may only be used for treatment or storage of remediation wastes (See 40 CFR §264.553(b)).

In establishing requirements for TUs seven factors must be considered: the length of time the unit operates; the type of unit; the volumes of remediation waste; the physical and chemical characteristics of the remediation waste; the potential for releases; the conditions at the site that will influence migration; and the potential for exposure if a release occurs. (See 40 CFR §264.553(c)).

All tanks and containers will be compatible with the waste and be in good condition. Where practicable, secondary containment will be provided when liquid wastes are stored or treated in tanks or containers. For closure of the TUs, if releases have been documented, then wastes and contaminated soil must be removed, if appropriate, and structures and equipment will be decontaminated or managed as waste.

6.2.8 Particulate, VOC and Hazardous Air Pollution (HAP) Emissions

Remediation activities have the potential to generate particulate radionuclide, fugitive dust, VOC, and HAP emissions. 5 CCR 1001-3, Regulation No. 1, governs opacity and particulate emissions. Regulation No. 1, Section II addresses opacity and require that stack emissions from the containment structure or fuel-fired equipment must not exceed 20% opacity. Regulation No. 1, Section III addresses the control of particulate emissions. Fugitive particulate emissions will be generated from soil excavation and transport. Control methods for fugitive particulate emission should be practical, economically reasonable, and technologically feasible.

During soil handling activities, dust minimization techniques such as water sprays, will be used to minimize suspension of particulates. In addition, earth moving operations will not be conducted during periods of high wind. The substantive requirements that would otherwise be incorporated into a control plan (see Regulation No. 1, Section III.D) are embodied in the RFETS Environmental Restoration Field Operation Procedure FO.1, Air Monitoring and Particulate Control, which will be incorporated into the project. In addition, any fuel-fired equipment such as generators or compressors must comply with a particulate emission limit (See Regulation No. 1, Section III.A).

5 CCR 1001-3, Regulation No. 3, provides authority to CDPHE to inventory emissions. Regulation No. 3, Part A, Section II requires that RFETS submit an Air Pollution Emissions Notification (APEN) to CDPHE prior to initiation of the Mound Site Plume project. Pursuant to RFCA, RFETS will prepare an APEN to facilitate the CDPHE inventory process.

5 CCR 1001-3, Regulation No. 7, regulates VOC emissions. Regulation No. 7, Section II requires that new sources of VOC utilize Reasonably Available Control Technologies (RACT). VOCs may be emitted during soil excavation, and transport. Although significant VOC

concentrations are not expected, a bounding assumption has been made that less than 1 ton of VOCs will be emitted from excavation and soil handling activities. Based on this assumption, RACT will be attained without implementing specific VOC controls for soil excavation, staging and replacement. (See Statement of Basis and Purpose, Regulation No. 3, Part D, July, 15, 1993).

Regulation No. 7, Section III governs the transfer and storage of VOCs and requires bottom or submerged fill for containers greater than 56 gallons. CDPHE has previously given guidance that any liquid containing any amount of an organic compound may be considered a VOC for purposes of this requirement. To the maximum extent practicable, storage tanks and related equipment must be maintained to prevent detectable vapor loss. This requirement is applicable to containers and tanks larger than 55 gallons used to dewater the excavation or used to manage decontamination water.

6.2.9 Debris Treatment

Decommissioning of the equipment and piping that is currently used to collect, store and transfer contaminated water to the Consolidated Water Treatment Facility for treatment may generate debris that contains F001 listed hazardous wastes.

Where appropriate, tanks, the project decontamination pad or the Main Decontamination Facility may be configured to perform low level, hazardous or mixed waste debris treatment in accordance with 40 CFR §262.34, §268.7(a)(4) and §268.45. Specifically, 40 CFR §268.45 Table 1, A.1.c. provides for treatment using high pressure steam and water sprays and 40 CFR §268.45 Table 1, A.2.a. provides for water washing and spraying. Following treatment, as long as the debris does not exhibit a hazardous waste characteristic, the debris will no longer contain a listed hazardous waste and will no longer be subject to RCRA hazardous waste requirements. Solid residues from the treatment of debris containing listed hazardous wastes will be collected and managed in accordance with RCRA hazardous waste management ARARs. Any solid residues from debris treatment that exhibit a hazardous waste characteristic will also be managed in accordance with RCRA hazardous waste management requirements.

Liquid residues from the treatment of debris containing listed hazardous wastes will be collected and transferred to the Consolidated Water Treatment Facility. Residues that result from the treatment of listed debris will carry the same listing as the listed debris from which it originated. Any Consolidated Water Treatment Facility residues that exhibit a hazardous waste characteristic will also be managed in accordance with RCRA hazardous waste management ARARs.

6.3 Location Specific Requirements and Considerations

6.3.1 Endangered Species Act

The Endangered Species Act, 50 CFR Part 17, and the Colorado Nongame, Endangered, or Threatened Species Conservation Act, CRS 33-2-101, et seq. are relevant and appropriate because the action has the potential to jeopardize critical habitat for the Prebles meadow jumping mouse. For that reason, applicable RFETS site procedures and DOE orders will be implemented to ensure attainment of these ARARs.

6.3.2 Fish and Wildlife Coordination Act

The Fish and Wildlife Coordination Act, 16 USC §661 is applicable because the modification to the wetlands and the creation of a flowing stream has the potential to impact wildlife. Coordination and consideration of the applicable ecological values will be accomplished using site procedures.

6.3.3 Wetland Assessment

Pursuant to Executive Order 11990, and 40 CFR Part 6 Appendix A, federal agencies must prevent, to the extent possible, the adverse impacts of destroying or modifying wetlands and must prevent direct or indirect support of new construction in wetlands if there is a practicable alternative. These requirements are applicable to the Mound Site Plume action and will be implemented using site procedures.

7.0 IMPLEMENTATION SCHEDULE

Installation of the collection/treatment system for the Mound Site plume is scheduled to commence during the early Fall of 1997 and system startup is anticipated to begin within 3 weeks of start of construction. Any delays, scope, or budget changes may affect this schedule. The groundwater collection and treatment system is expected to be the long term remedy for the Mound Site Plume and to operate indefinitely.

8.0 REFERENCES

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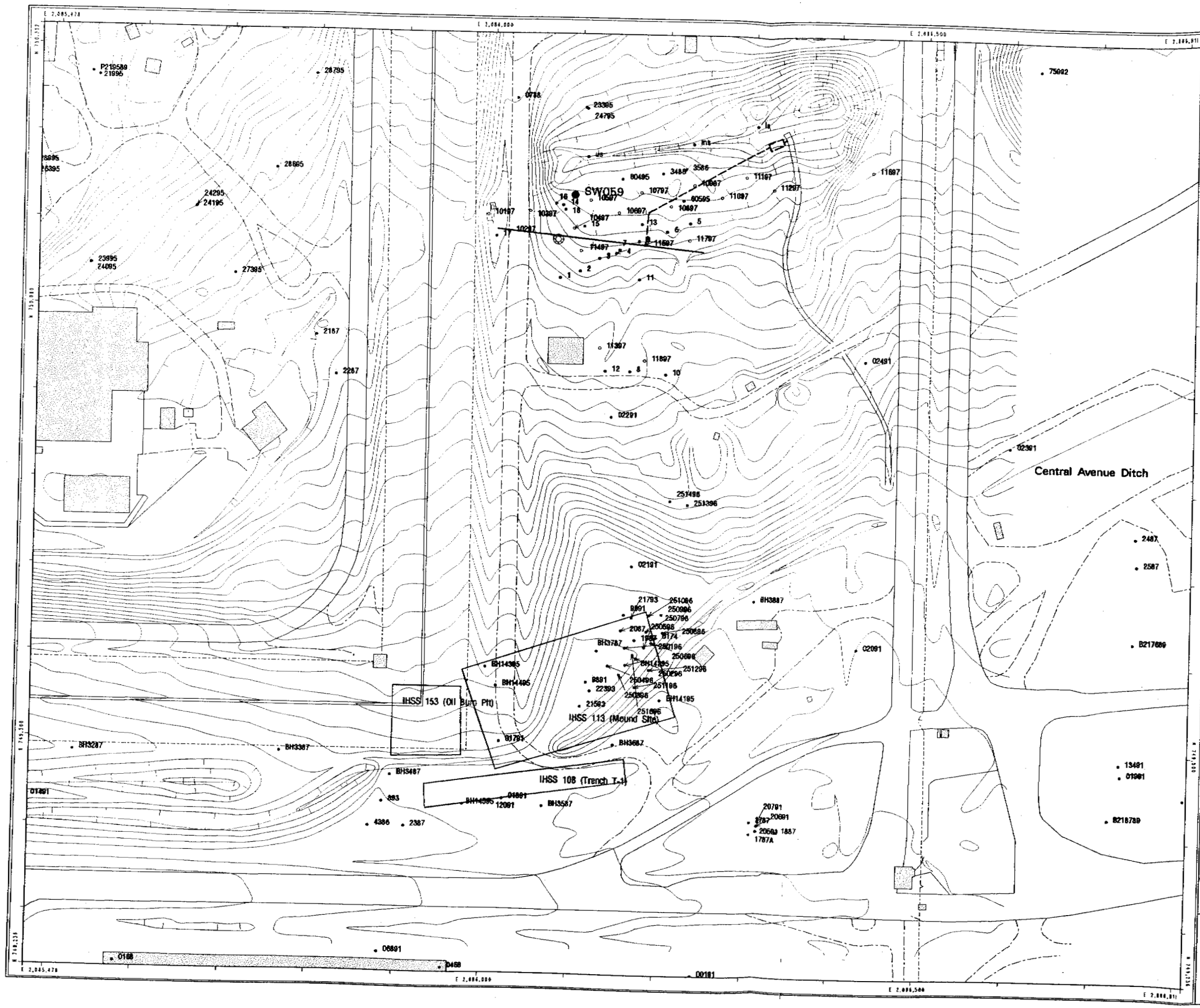
RMRS, 1996c, *Results of the 1996 Pre-Remedial Investigation of the Mound Site*, RF/RMRS-96-0055.UN.

Figure 1
Mound Site Plume Area



EXPLANATION

- Selected IHSS Boundaries
- Collection Trench
- Piping and Treatment System
- Surface Water Monitoring Locations
- Groundwater Monitoring Wells & Piezometers
- EPA Geoprobe Sampling Locations
- Boreholes
- Recent Geoprobe Sampling Locations
- SW059 Holding Tank
- 2 Foot Contours

Standard Map Features

- Buildings
- Lakes and ponds
- Streams, ditches, or other drainage features
- Fences
- Rocky Flats boundary
- Paved roads
- Dirt roads

DATA SOURCE:
Buildings, roads, and fences provided by Facilities Engr, 69AB Rocky Flats, Inc. - 1991.
Hydrology provided by USGS - date unknown)

Scale = 1 : 1400
1 inch represents approximately 117 feet

40 0 80 160ft

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by:
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MAP ID: 97-0044

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fgis1/data/rfp-map-sm/97-0044/master.aml